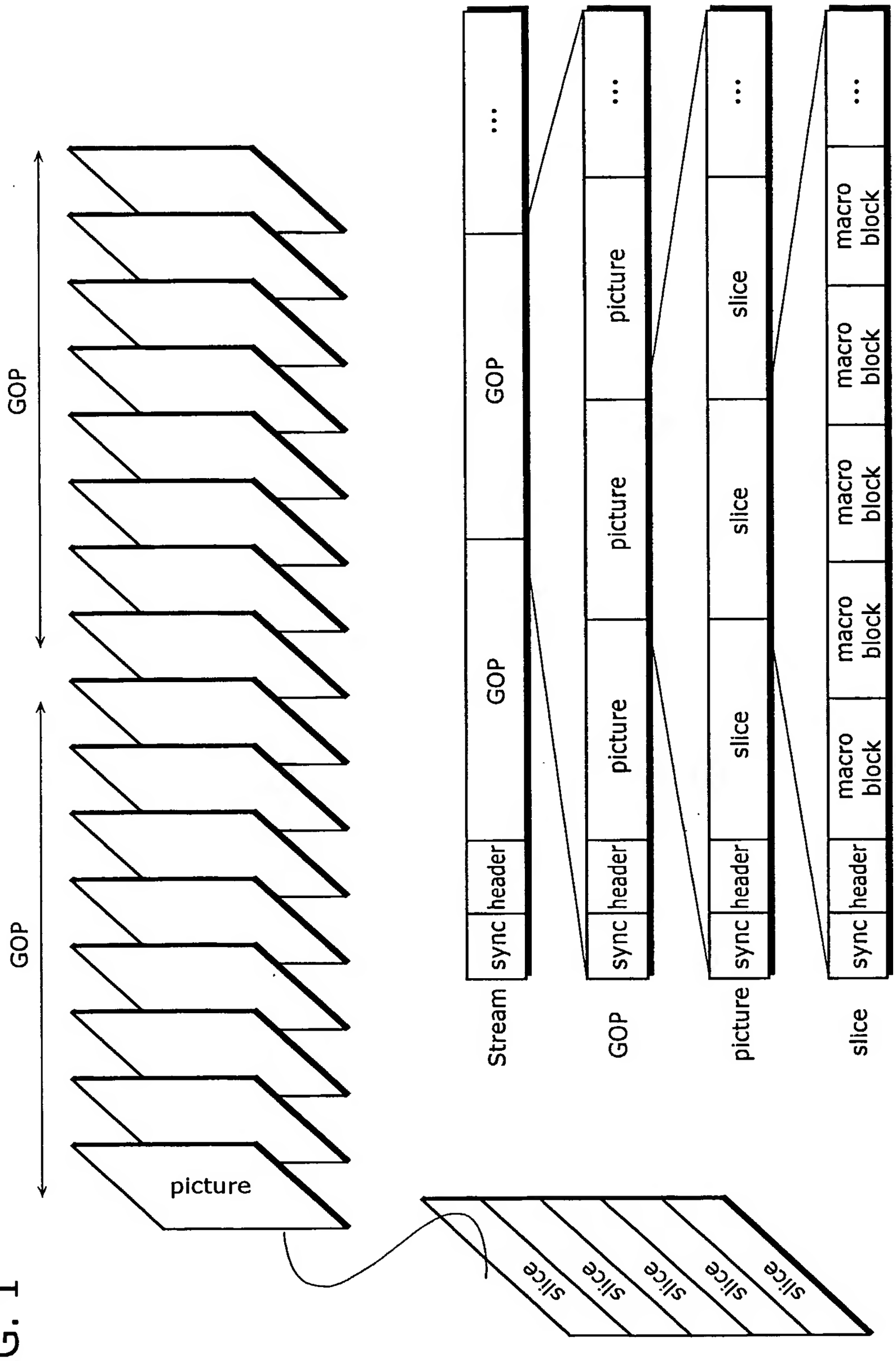

GOP
GOP
picture
Stream
GOP
picture
slice
sync
header
macro block
slice

FIG. 1

FIG. 2

Low frequency

Horizontal high frequency

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 8 | 16 | 19 | 22 | 26 | 27 | 29 | 34 |
| 16 | 16 | 22 | 24 | 27 | 29 | 34 | 37 |
| 19 | 22 | 26 | 27 | 29 | 34 | 34 | 38 |
| 22 | 22 | 24 | 27 | 29 | 34 | 37 | 40 |
| 22 | 26 | 27 | 29 | 32 | 35 | 40 | 48 |
| 26 | 27 | 29 | 32 | 35 | 40 | 48 | 58 |
| 26 | 27 | 29 | 34 | 38 | 46 | 56 | 69 |
| 27 | 29 | 35 | 38 | 46 | 56 | 69 | 83 |

Vertical high frequency

FIG. 3

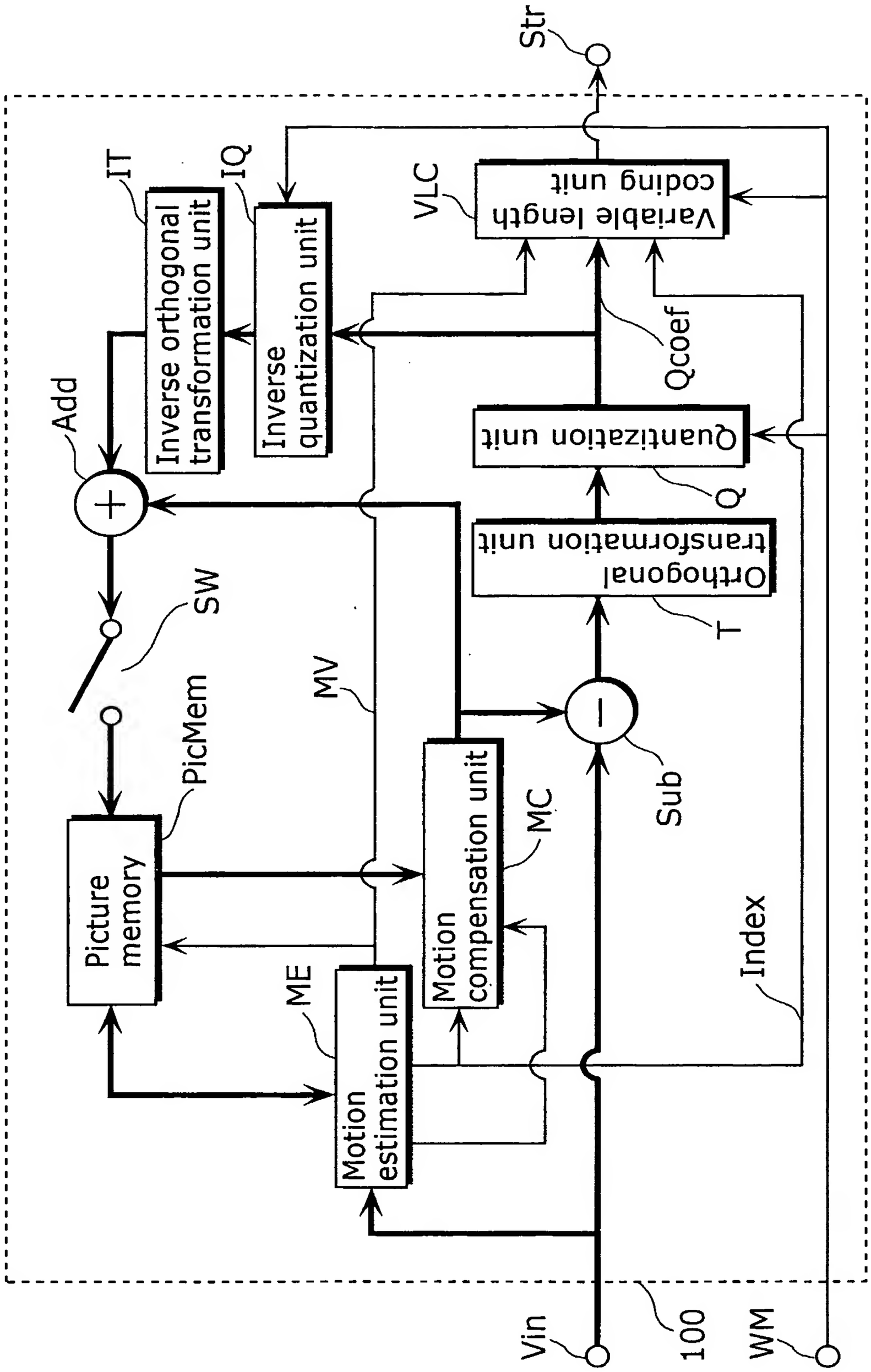
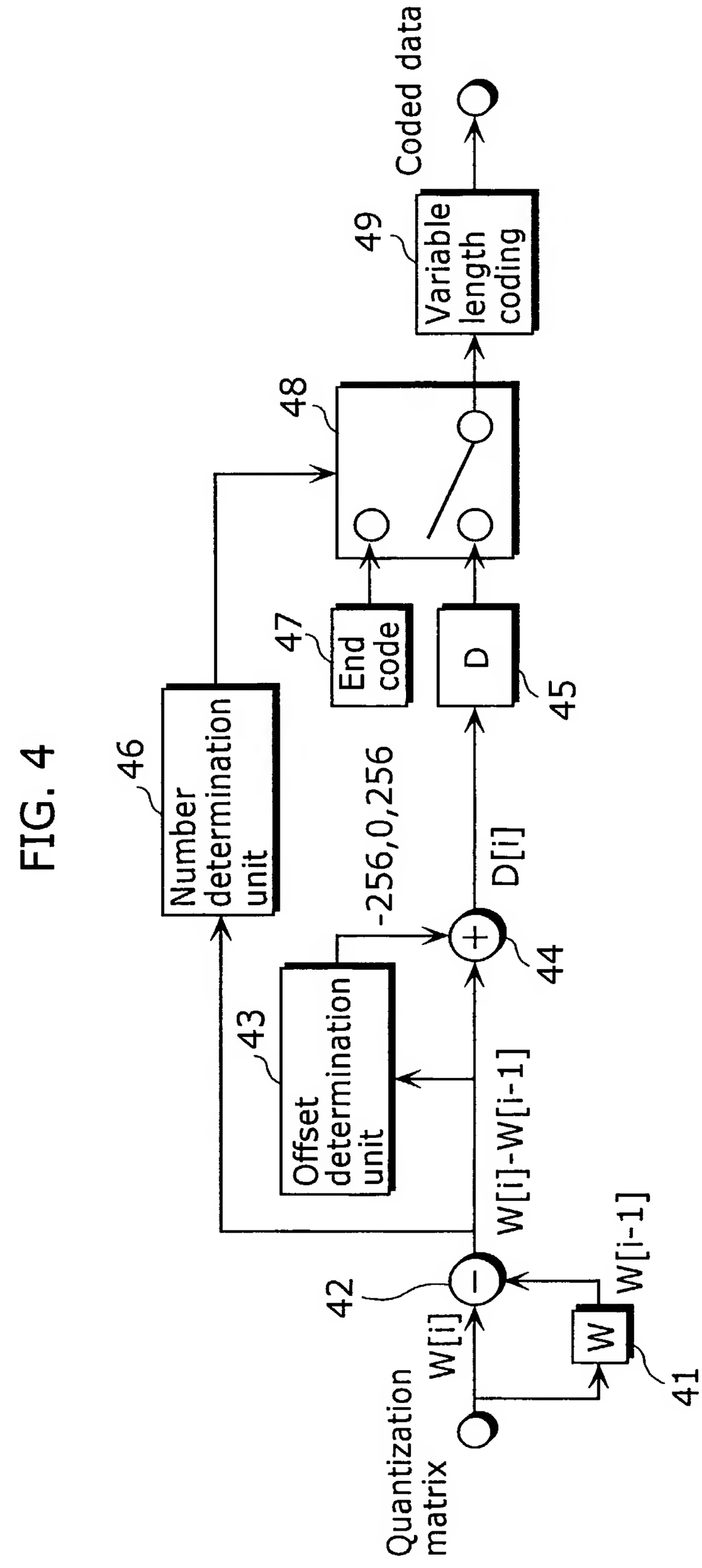

Str
IT
IQ
VLC
Variable length coding unit
Inverse orthog transformation
Inverse quantization u
Qcoef
Add
Quantization unit
Q
Orthogonal transformation unit
T
SW
MV
PicMem
Picture memory
Motion compensation unit
MC
Sub
ME
Motion estimation un
Index
Vin
100
WM

FIG. 4


Coded data
49
Variable length coding
48
47
End code
D
45
46
Number determination unit
-256,0,256
D[i]
44
43
Offset determination unit
W[i]-W[i-1]
42
W[i]
W[i-1]
W
41
Quantization matrix

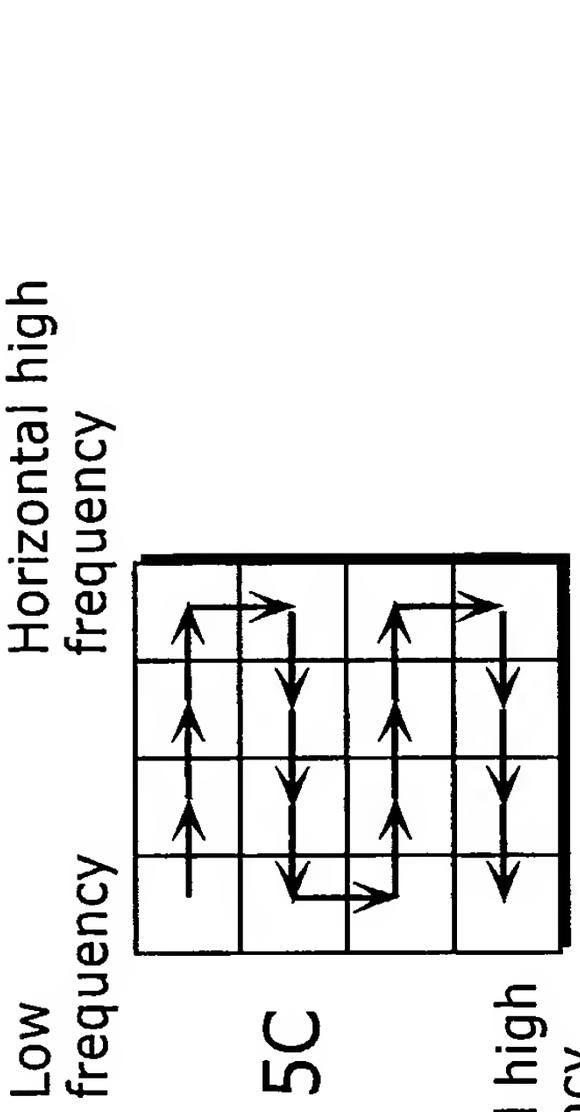



FIG. 5C

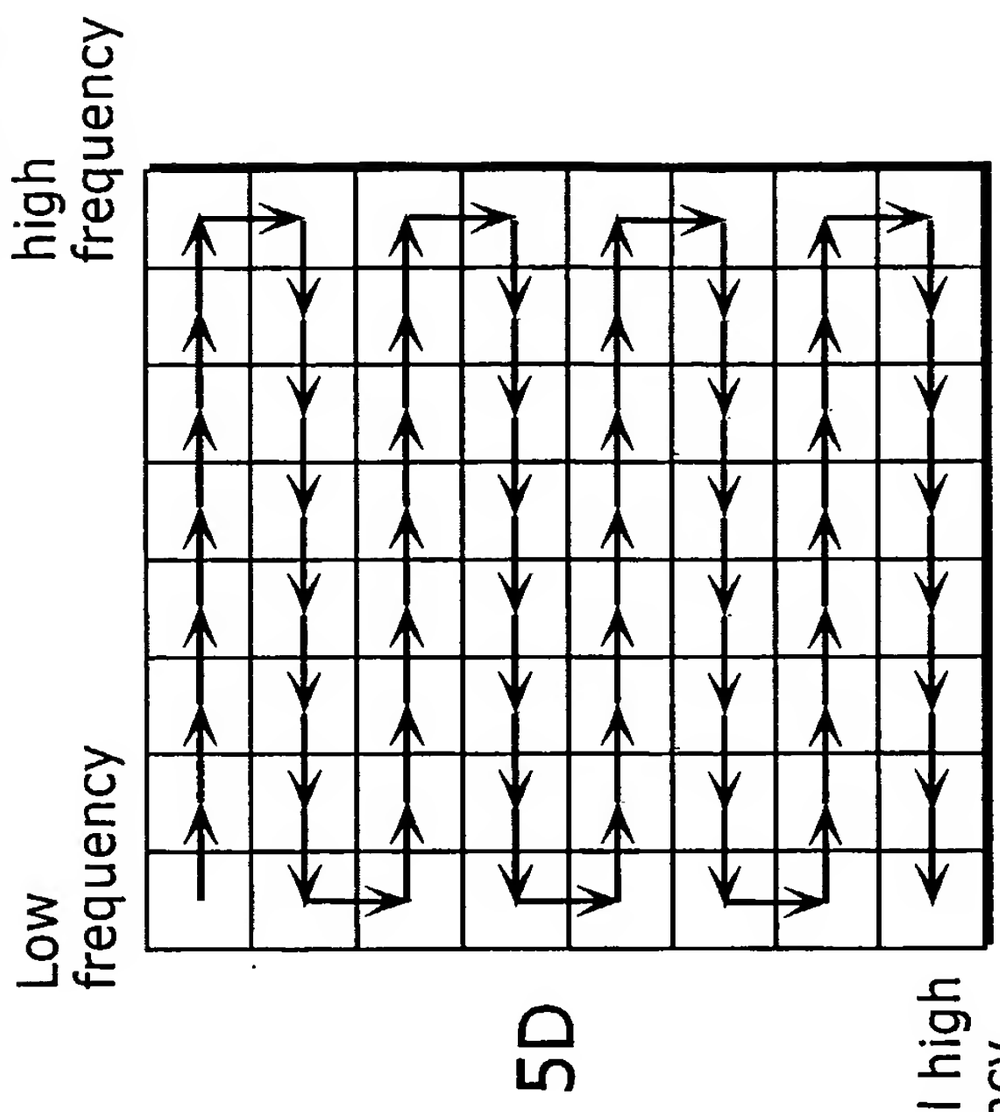



FIG. 5D

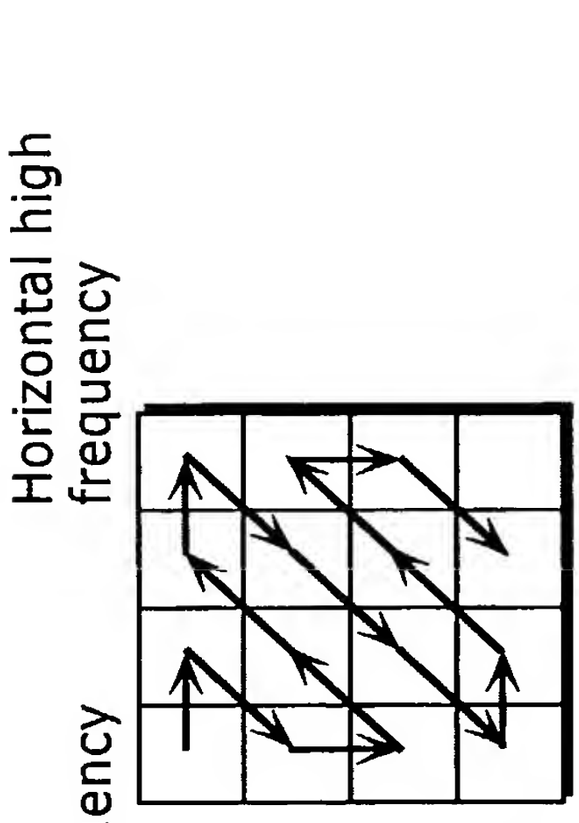



FIG. 5A

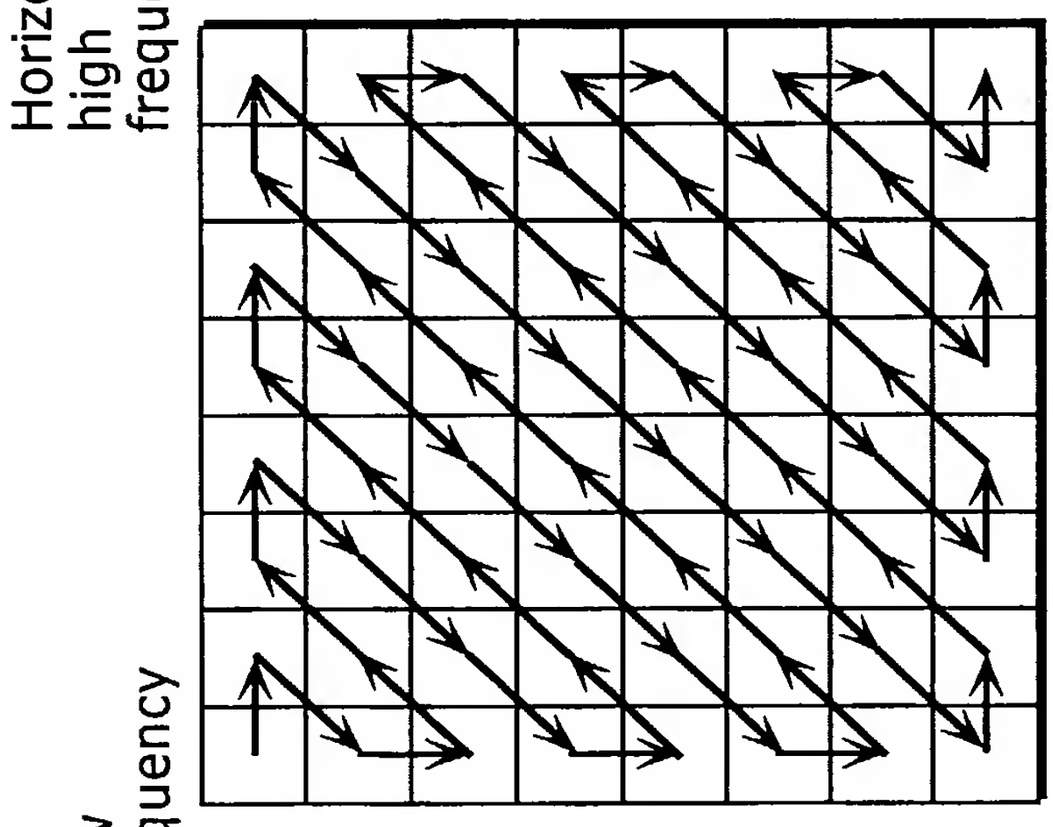



FIG. 5B

FIG. 6C

| Code | 0001000 | 00100 | 1 | 00100 | 011 | . . . | End code |
|---|---|---|---|---|---|---|---|
| W[i] → | D[i] → | | | | | | |
| W[0]=16 → | D[0]=8 → | | | | | | |
| W[1]=18 → | D[1]=2 → | | | | | | |
| W[2]=18 → | D[2]=0 → | | | | | | |
| W[3]=21 → | D[3]=3 → | | | | | | |
| W[4]=20 → | D[4]=-1 → | | | | | | |
| . . . | . . . | | | | | | |
| W[30]=64 → | D[30]=0 → | | | | | | |
| W[31]=64 → | D[31]=0 → | | | | | | |
| . . . | . . . | | | | | | |
| W[62]=64 → | D[62]=0 → | | | | | | |
| W[63]=64 → | D[63]=0 → | | | | | | |

FIG. 6A

| W[0]= 16 | W[1]= 18 | . . . | . . . |
|---|---|---|---|
| W[2]= 18 | W[4]= 20 | . . . | |
| W[3]= 21 | . . . | | |
| . . . | | | |

FIG. 6B

| D[0]= 8 | D[1]= 2 | . . . | . . . |
|---|---|---|---|
| D[2]= 0 | D[4]= -1 | . . . | |
| D[3]= 3 | . . . | | |
| . . . | | | |

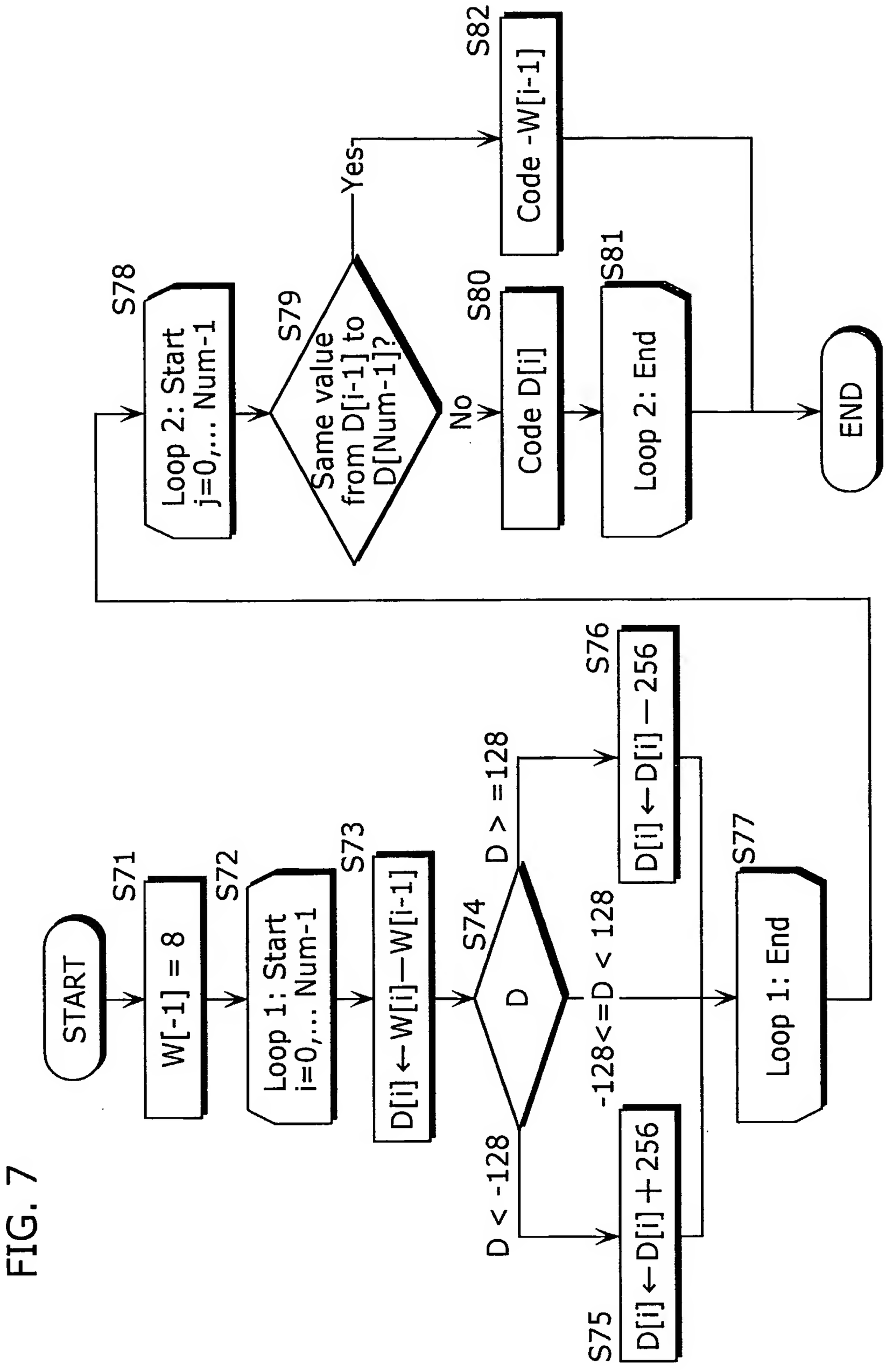

START
S71
W[-1] = 8
S72
Loop 1: Start
i=0,... Num-1
S73
D[i] ← W[i] — W[i-1]
S74
D
D < -128
D > =128
-128<=D < 128
S75
D[i] ← D[i] + 256
S76
D[i] ← D[i] — 256
S77
Loop 1: End
S78
Loop 2: Start
j=0,... Num-1
S79
Same value
from D[i-1] to
D[Num-1]?
No
Yes
S80
Code D[i]
S81
Code -W[i-1]
S8
Loop 2: End
END

FIG. 7

FIG. 8C

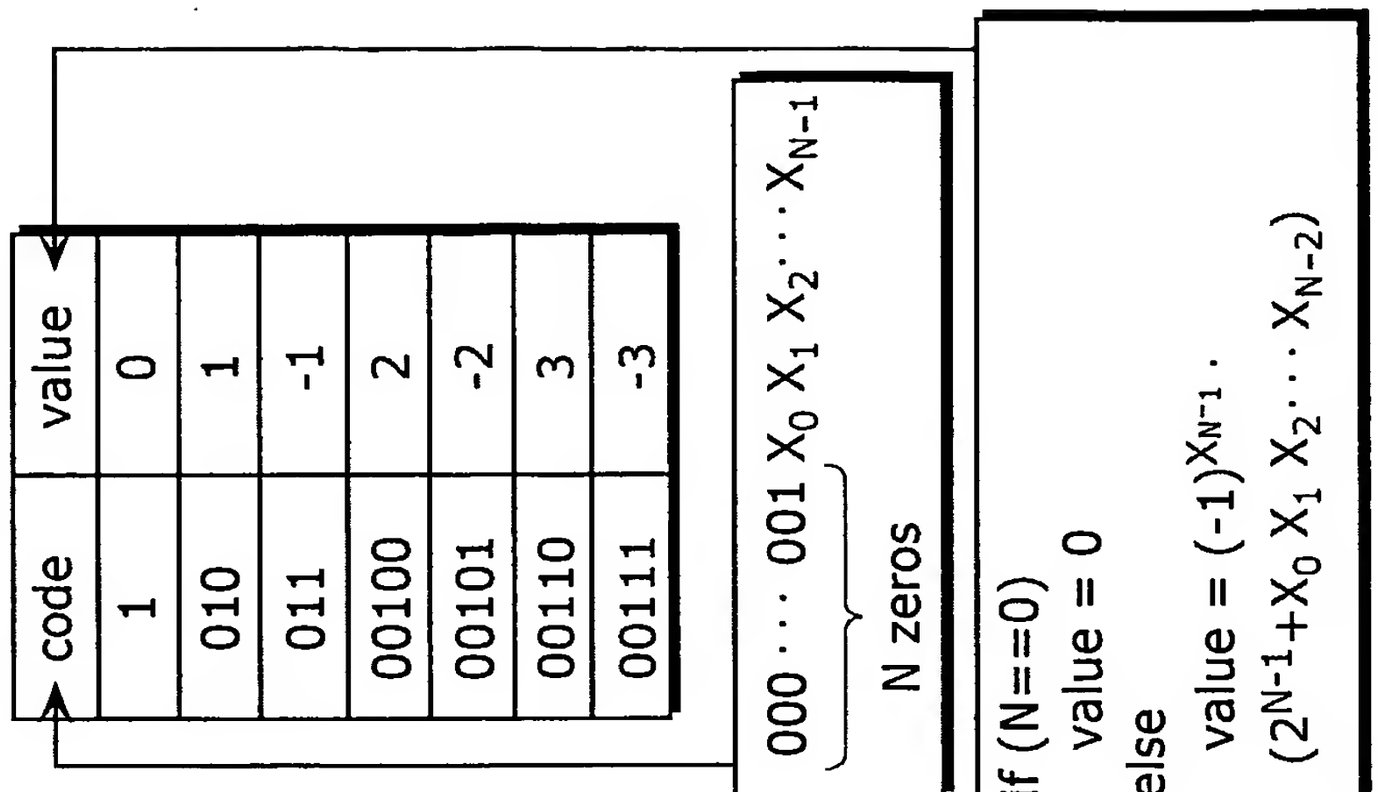



FIG. 8B

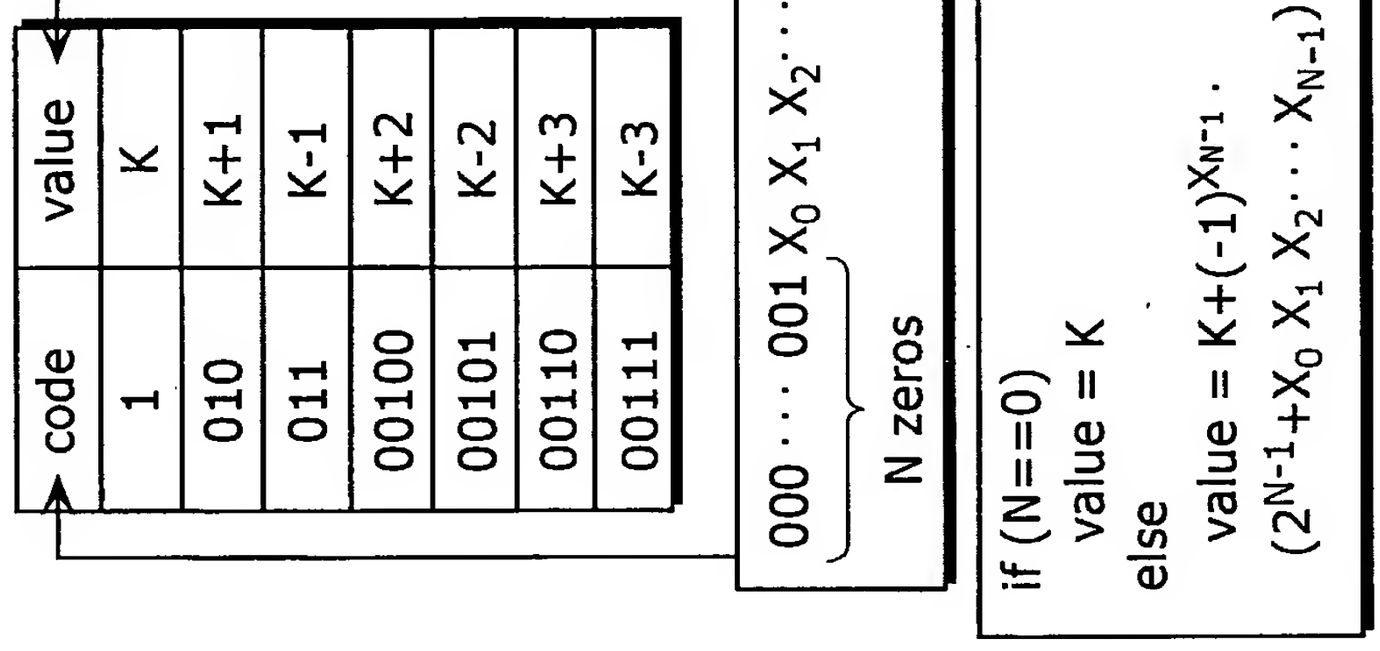
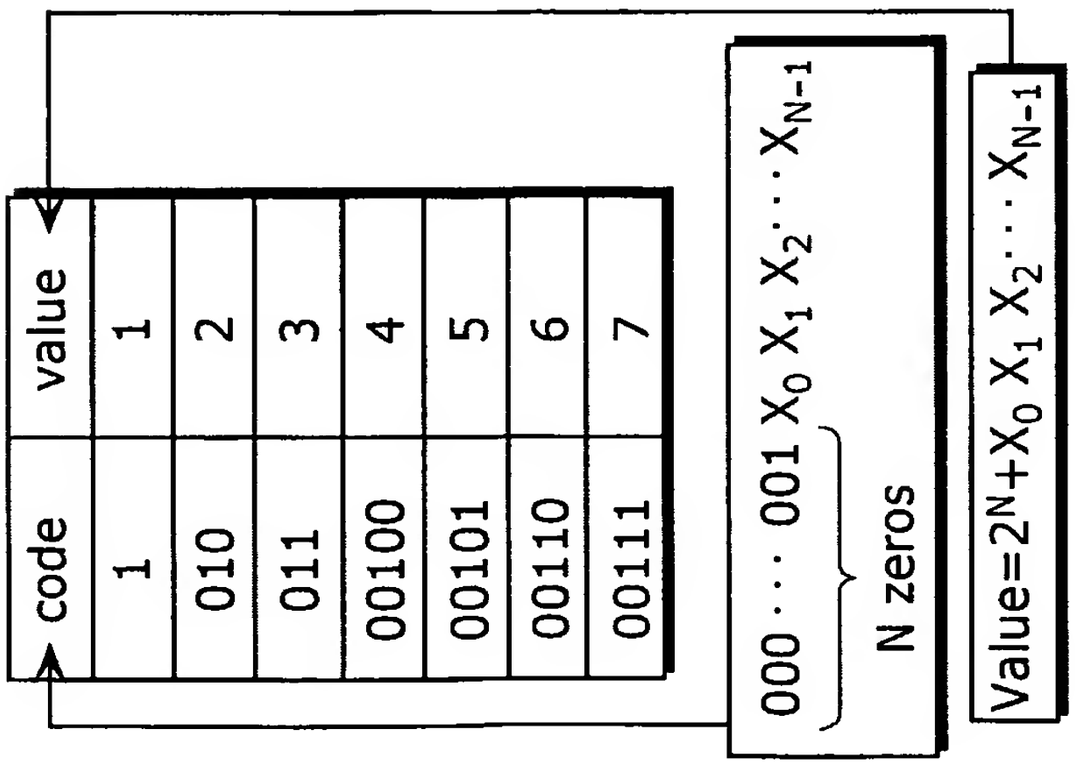



FIG. 8A



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| $W_{00}$ | $W_{01}$ | $W_{02}$ | $W_{03}$ | $W_{04}$ | $W_{05}$ | $W_{06}$ | $W_{07}$ |
| $W_{10}$ | $W_{11}$ | $W_{12}$ | $W_{13}$ | $W_{14}$ | $W_{15}$ | $W_{16}$ | $W_{17}$ |
| $W_{20}$ | $W_{21}$ | $W_{22}$ | $W_{23}$ | $W_{24}$ | $W_{25}$ | $W_{26}$ | $W_{27}$ |
| $W_{30}$ | $W_{31}$ | $W_{32}$ | $W_{33}$ | $W_{34}$ | $W_{35}$ | $W_{36}$ | $W_{37}$ |
| $W_{40}$ | $W_{41}$ | $W_{42}$ | $W_{43}$ | $W_{44}$ | $W_{45}$ | $W_{46}$ | $W_{47}$ |
| $W_{50}$ | $W_{51}$ | $W_{52}$ | $W_{53}$ | $W_{54}$ | $W_{55}$ | $W_{56}$ | $W_{57}$ |
| $W_{60}$ | $W_{61}$ | $W_{62}$ | $W_{63}$ | $W_{64}$ | $W_{65}$ | $W_{66}$ | $W_{67}$ |
| $W_{70}$ | $W_{71}$ | $W_{72}$ | $W_{73}$ | $W_{74}$ | $W_{75}$ | $W_{76}$ | $W_{77}$ |

FIG. 9A

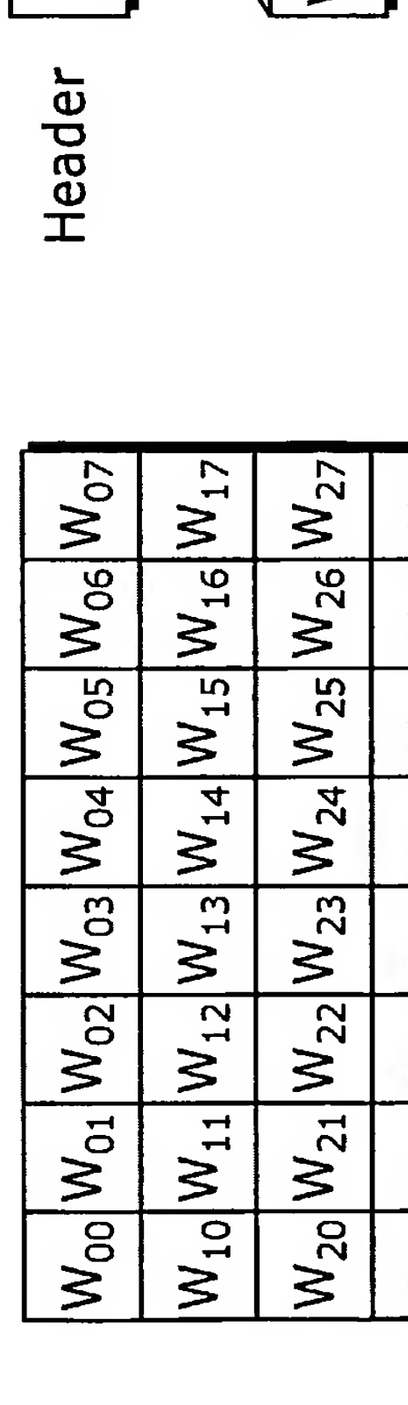



FIG. 9B

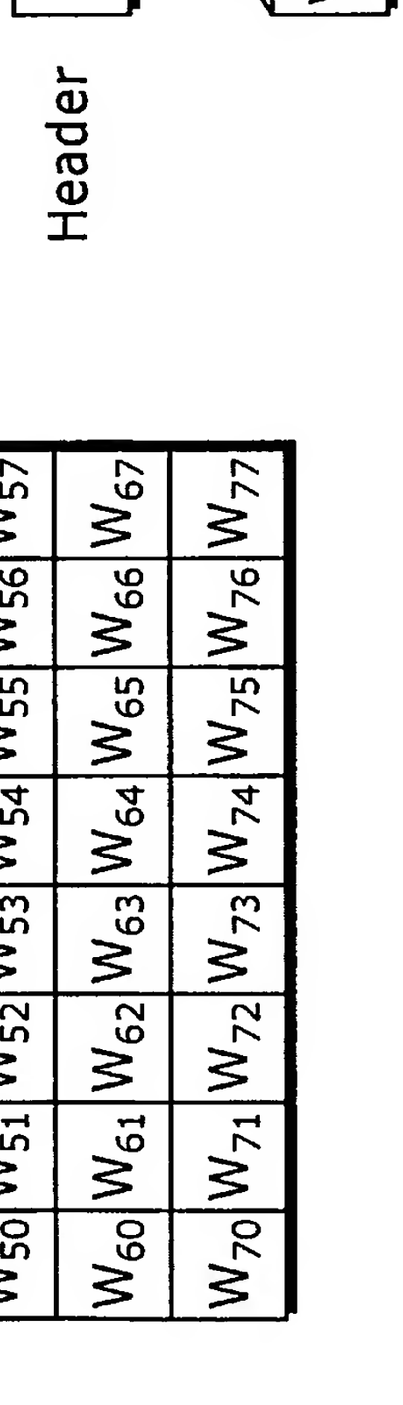



FIG. 9C

FIG. 10

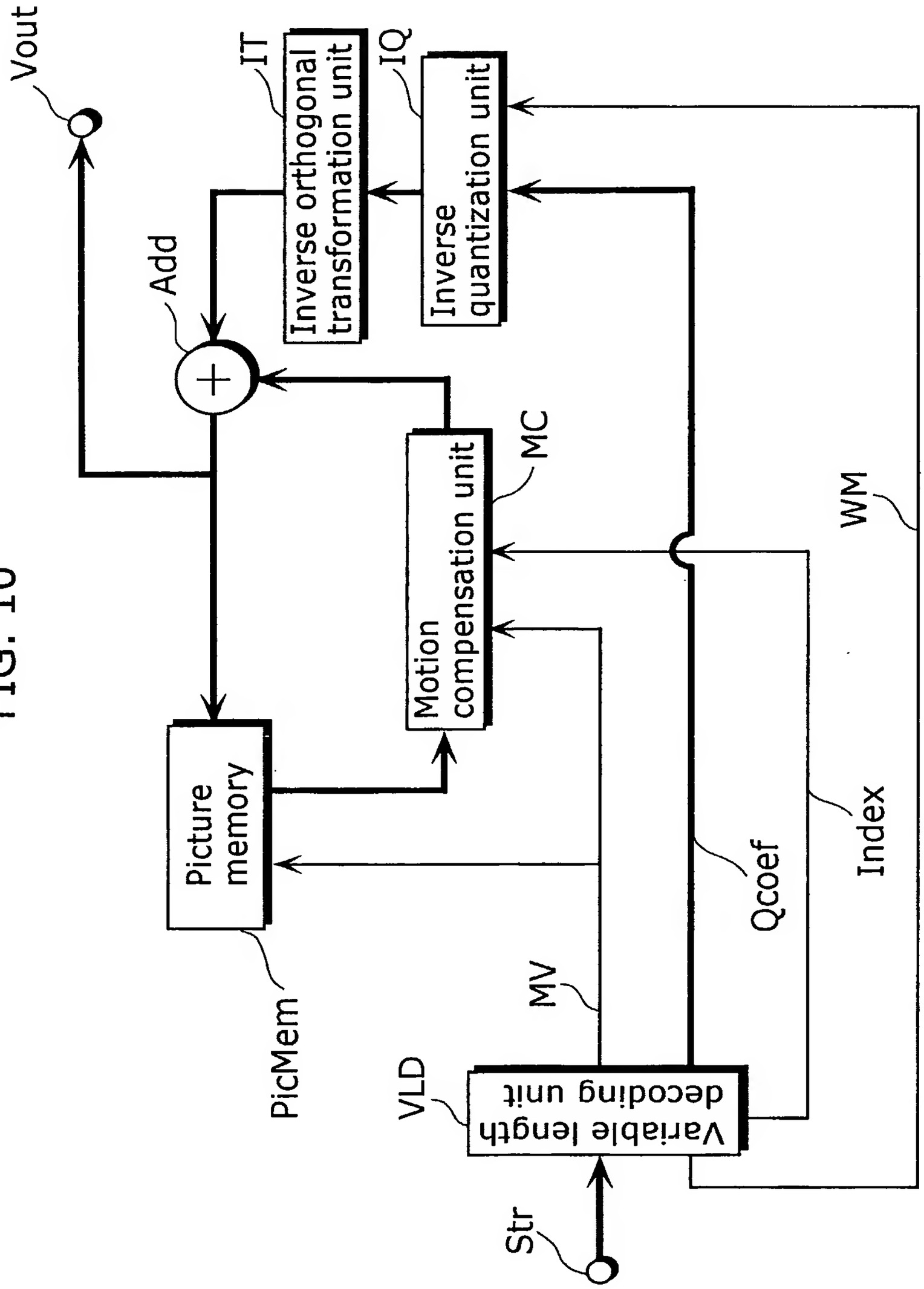

Vout
Add
IT
Inverse orthogonal transformation unit
IQ
Inverse quantization unit
Motion compensation unit
MC
Picture memory
PicMem
MV
VLD
Variable length decoding unit
Str
WM
Qcoef
Index

FIG. 11

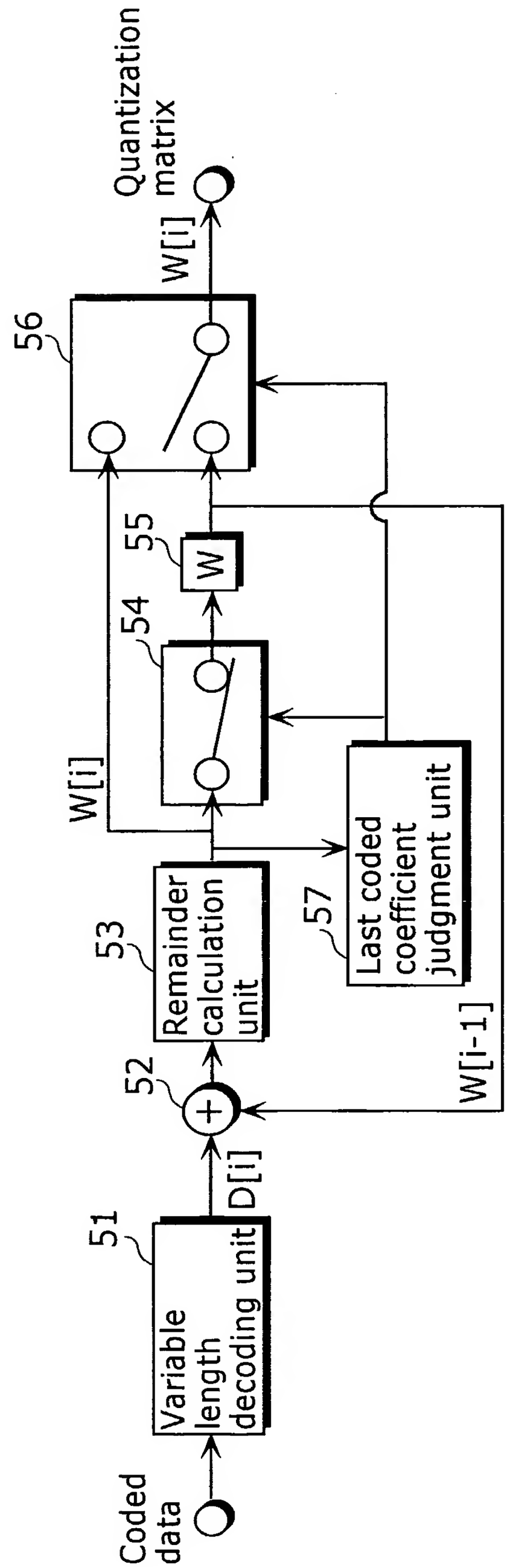

Coded data
51
Variable length decoding unit
D[i]
52
53
Remainder calculation unit
W[i]
54
55
W
56
Quantization matrix
W[i]
57
Last coded coefficient judgment unit
W[i-1]

FIG. 12

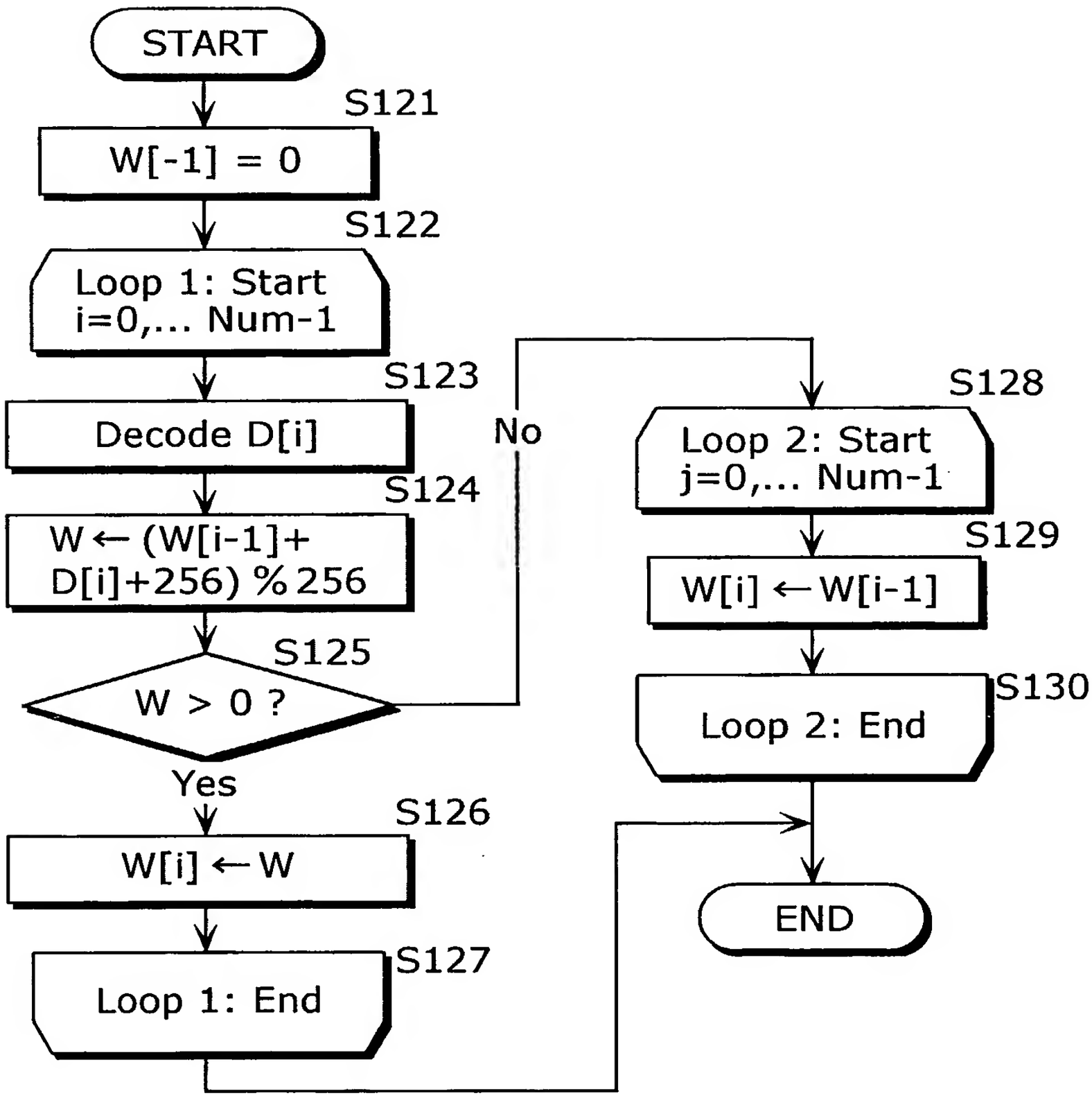

START
S121
W[-1] = 0
S122
Loop 1: Start
i=0,... Num-1
S123
Decode D[i]
S124
W ← (W[i-1]+
D[i]+256) % 256
S125
W > 0 ?
No
Yes
S126
W[i] ← W
S127
Loop 1: End
S128
Loop 2: Start
j=0,... Num-1
S129
W[i] ← W[i-1]
S130
Loop 2: End
END

FIG. 13A

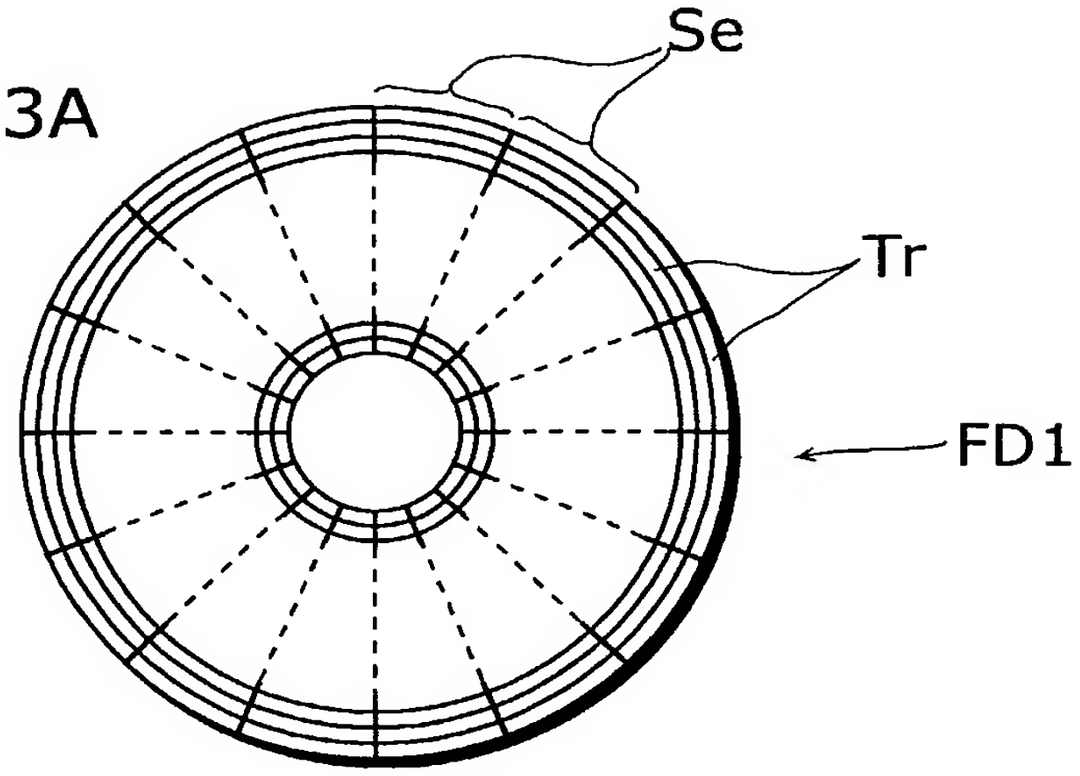



FIG. 13B

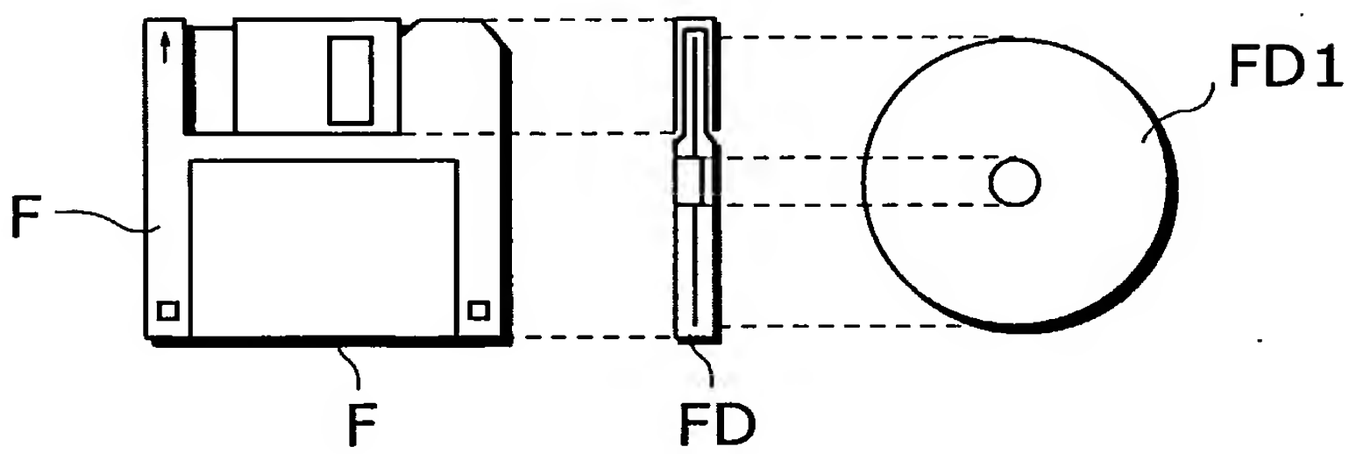
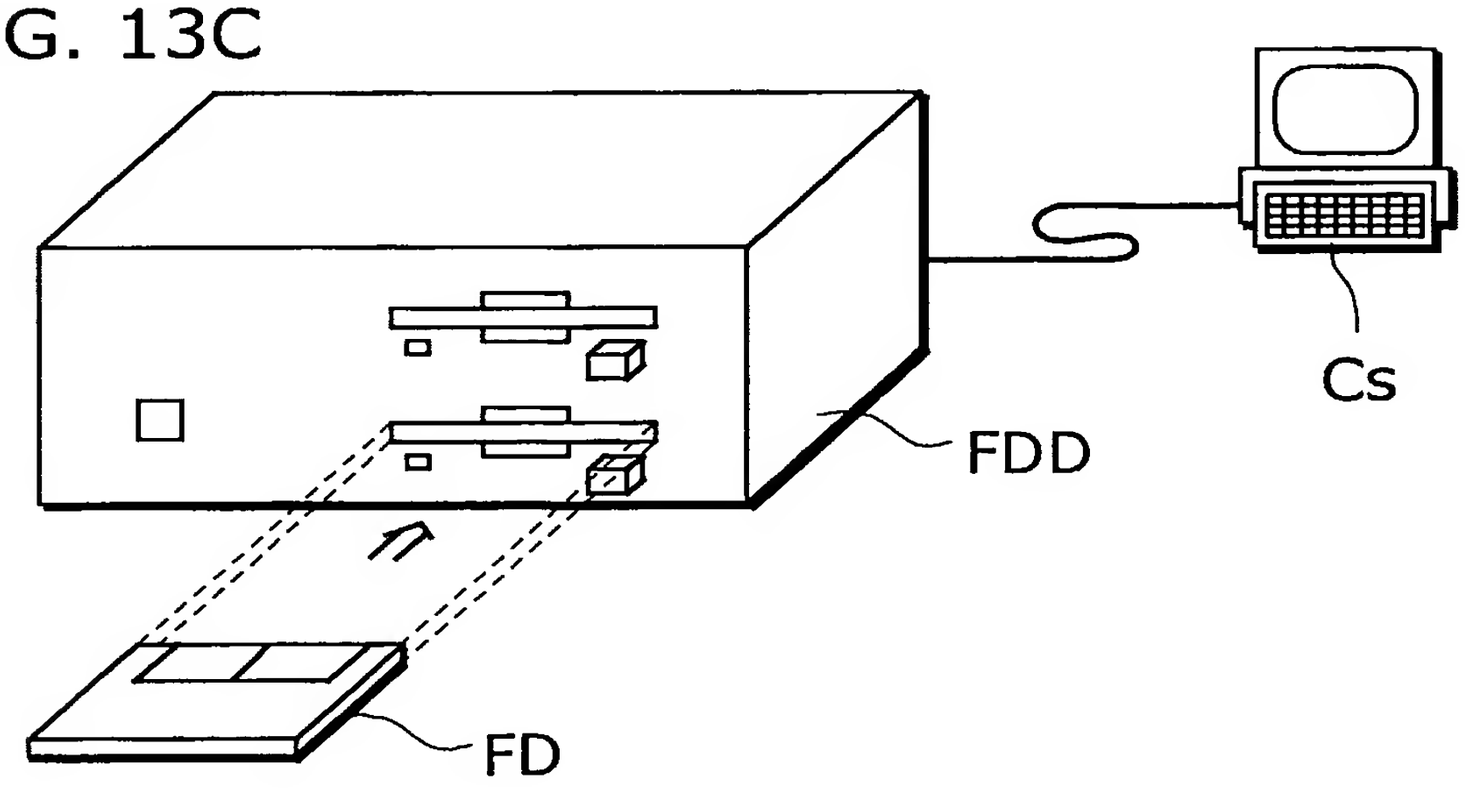



FIG. 13C



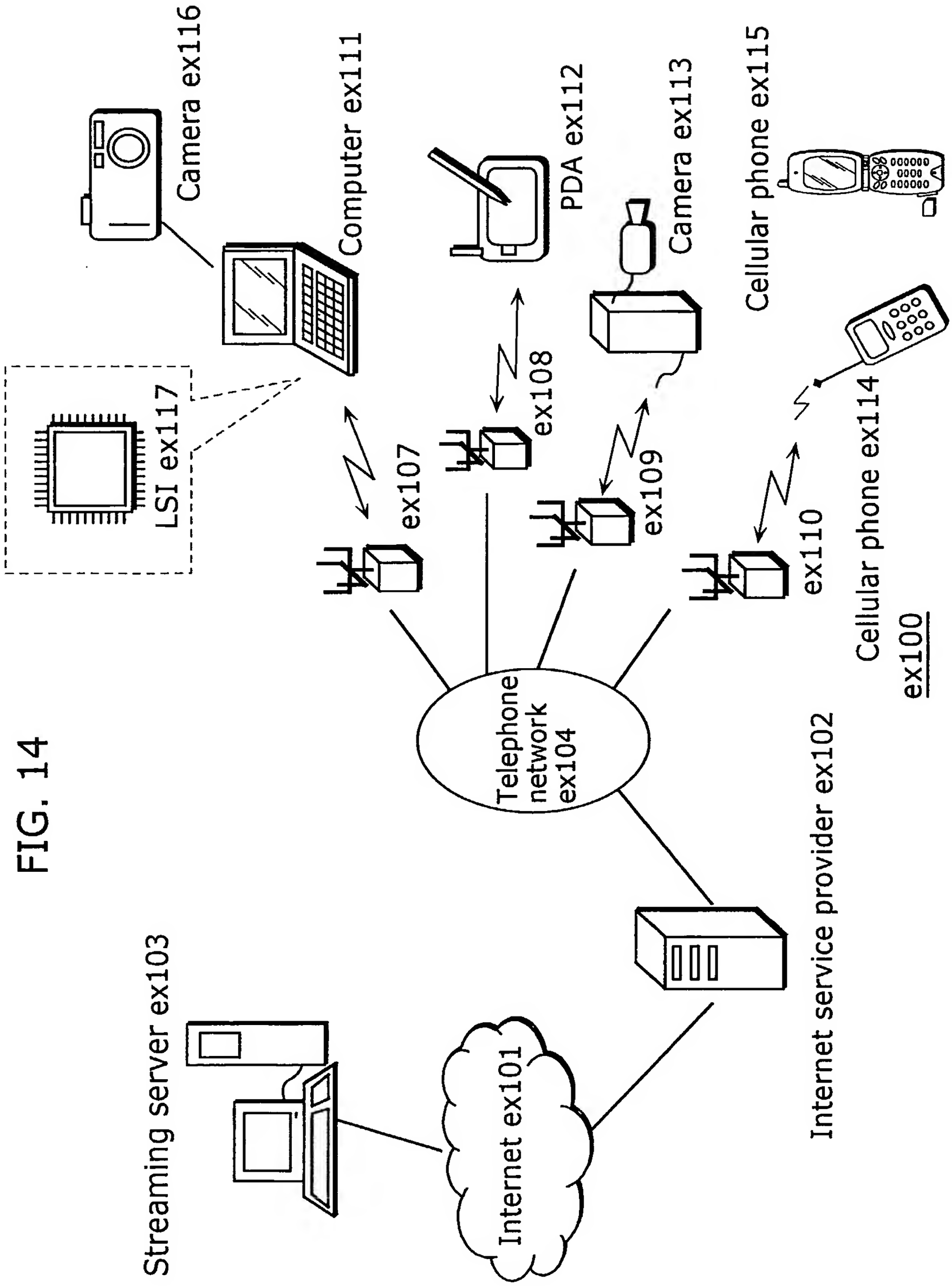
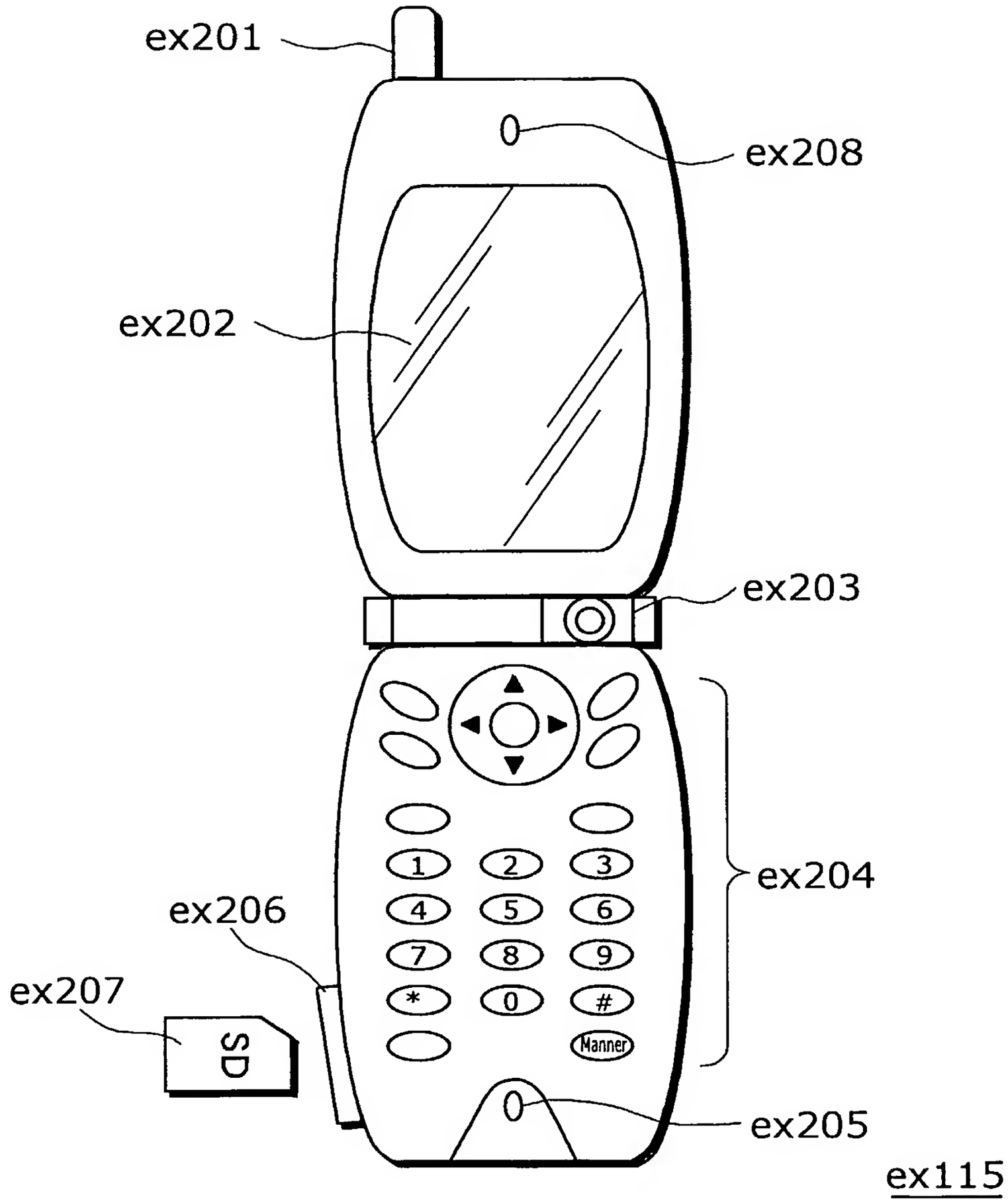

Camera ex116
Computer ex111
LSI ex117
PDA ex112
Camera ex113
Cellular phone ex115
ex108
ex107
ex109
ex110
Cellular phone ex114
ex100
Telephone network ex104
Internet service provider ex102
Streaming server ex103
Internet ex101

FIG. 14

FIG. 15


ex201
ex208
ex202
ex203
ex204
ex206
ex207
SD
Manner
ex205
ex115

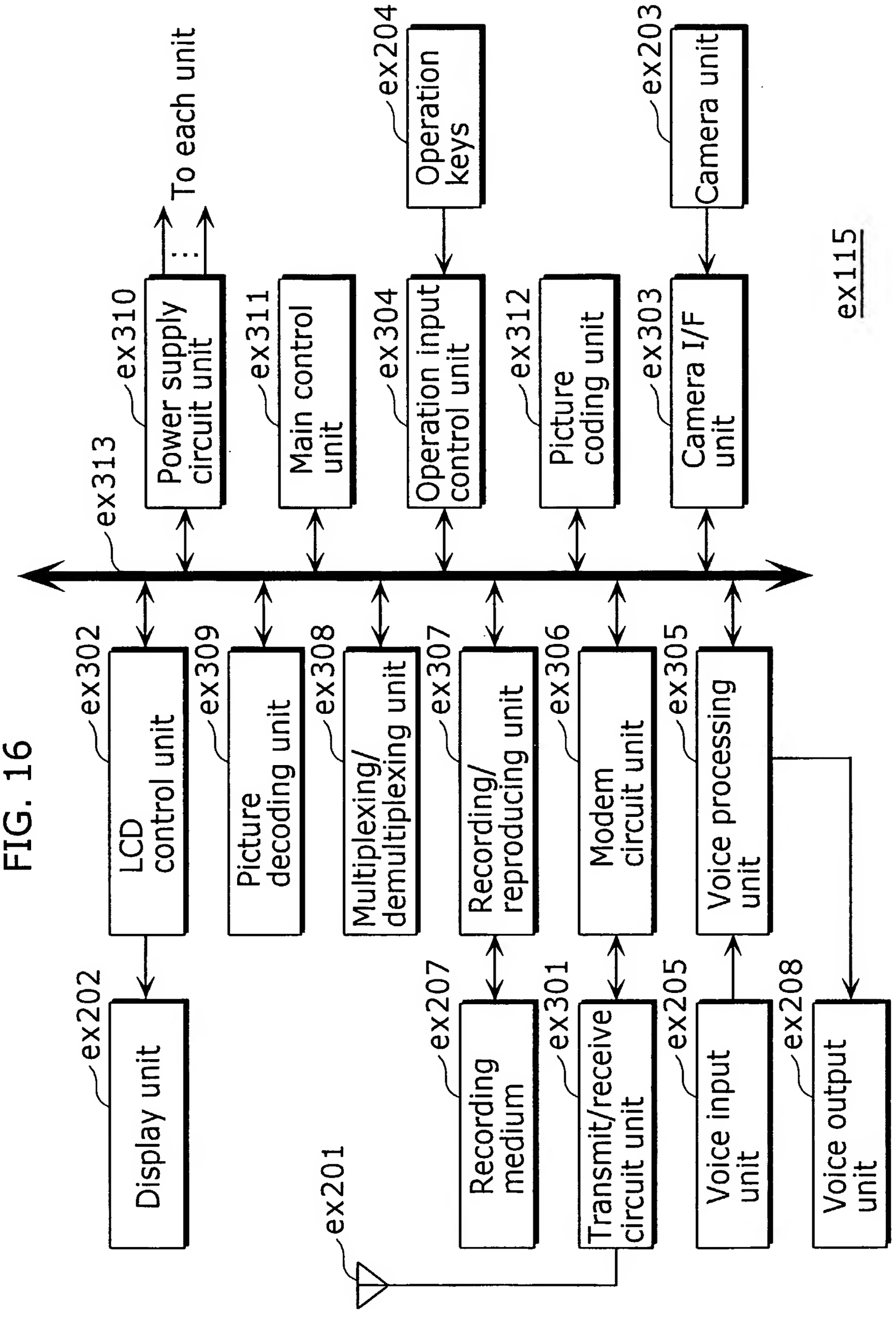
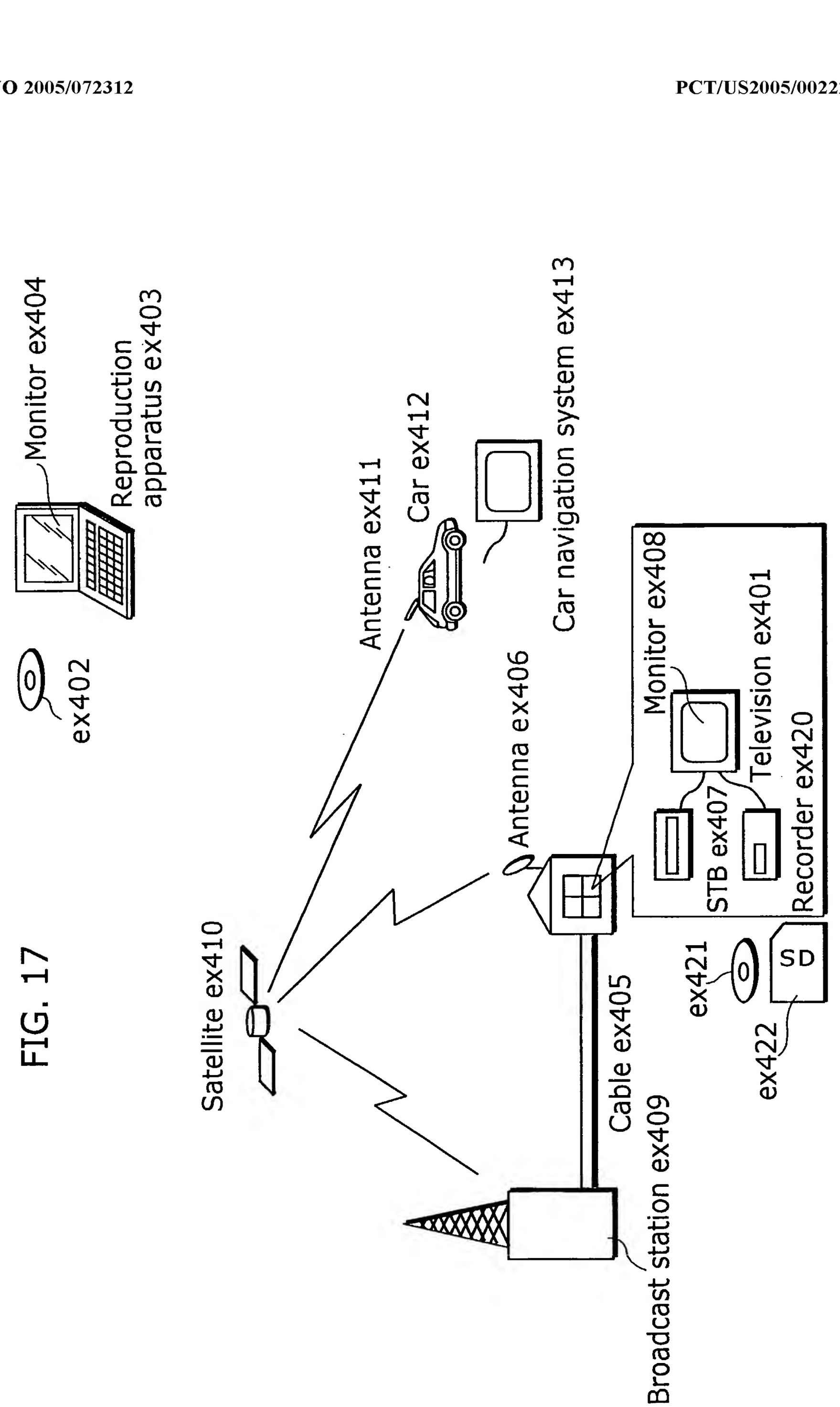

To each unit
ex204
Operation keys
ex203
Camera unit
ex115
ex310
Power supply circuit unit
ex311
Main control unit
ex304
Operation input control unit
ex312
Picture coding unit
ex303
Camera I/F unit
ex313
ex302
LCD control unit
ex309
Picture decoding unit
ex308
Multiplexing/ demultiplexing unit
ex307
Recording/ reproducing unit
ex306
Modem circuit unit
ex305
Voice processing unit
ex202
Display unit
ex207
Recording medium
ex301
Transmit/receive circuit unit
ex205
Voice input unit
ex208
Voice output unit
ex201

FIG. 16

FIG. 17


Monitor ex404
Reproduction apparatus ex403
ex402
Antenna ex411
Car e
Car navigation system ex413
Car navigation ex412
Satellite ex410
Antenna ex406
Monitor ex408
Television ex401
STB ex407
Recorder ex420
Cable ex405
ex421
SD
ex422
409
Broadcast station ex40